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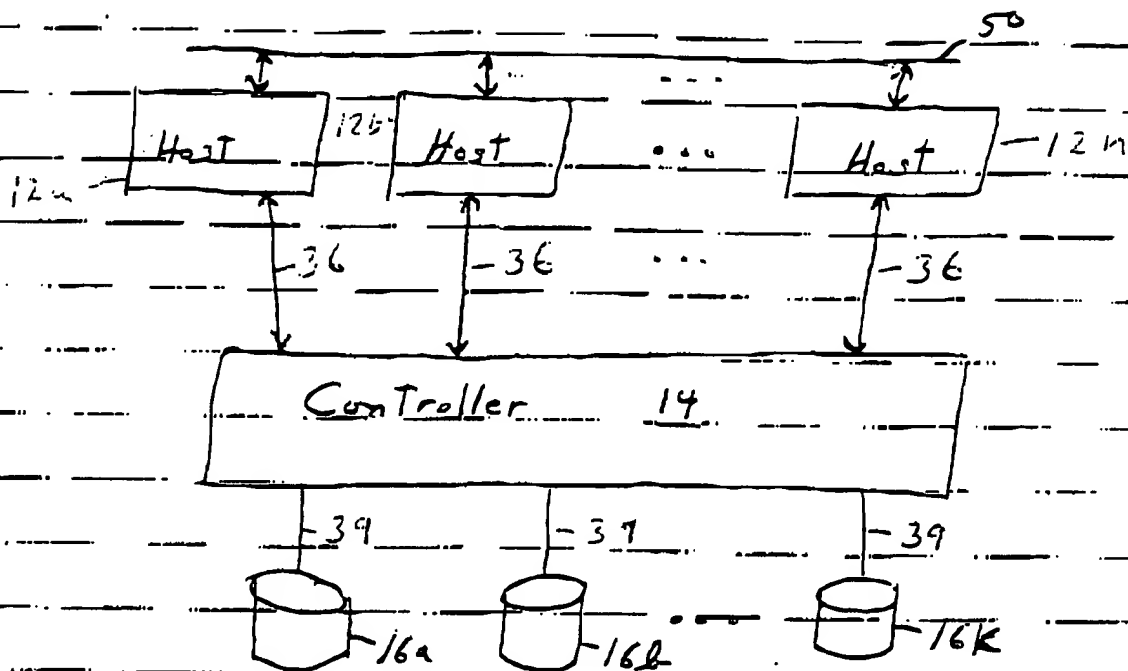


Fig 1

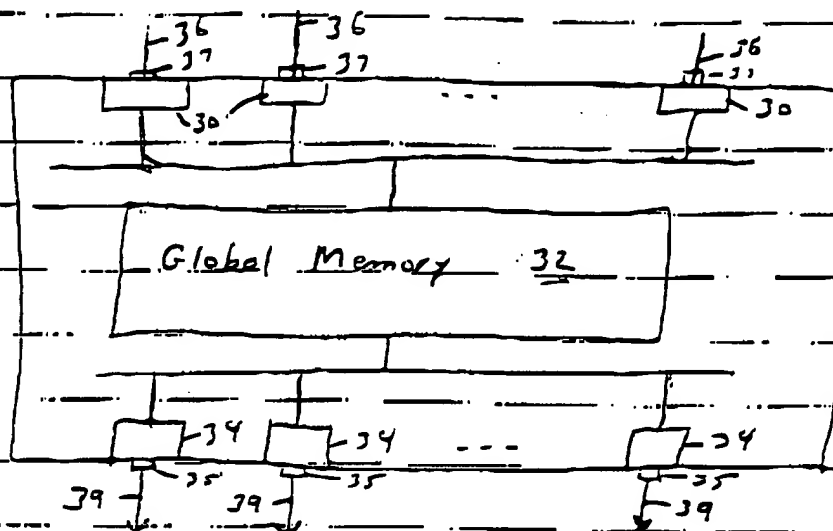


Fig. 2

00542663-1081300

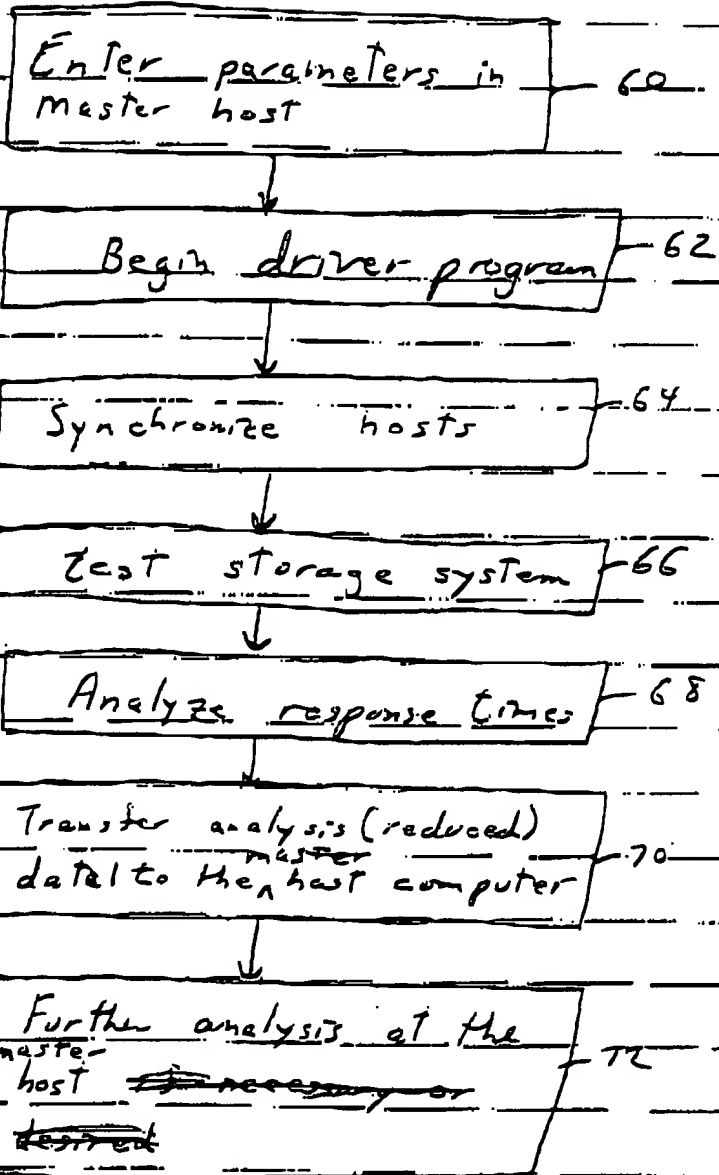


Fig. 3



START

Read required and  
optional Arguments

100

Store Arguments in  
data files

102

Use driver program  
to set up hosts

106

time synchronize  
all hosts

108

transfer configuration  
and parameter files  
to client hosts

110

initiate test

112

test  
complete?

No

Yes

114

126

reduce collected data

116

Transfer collected data  
to master host

118

effect data analysis

120

another  
test?

Y

N

104

No

further  
analysis  
data

Yes

122

next  
configuration

124

Fig 5

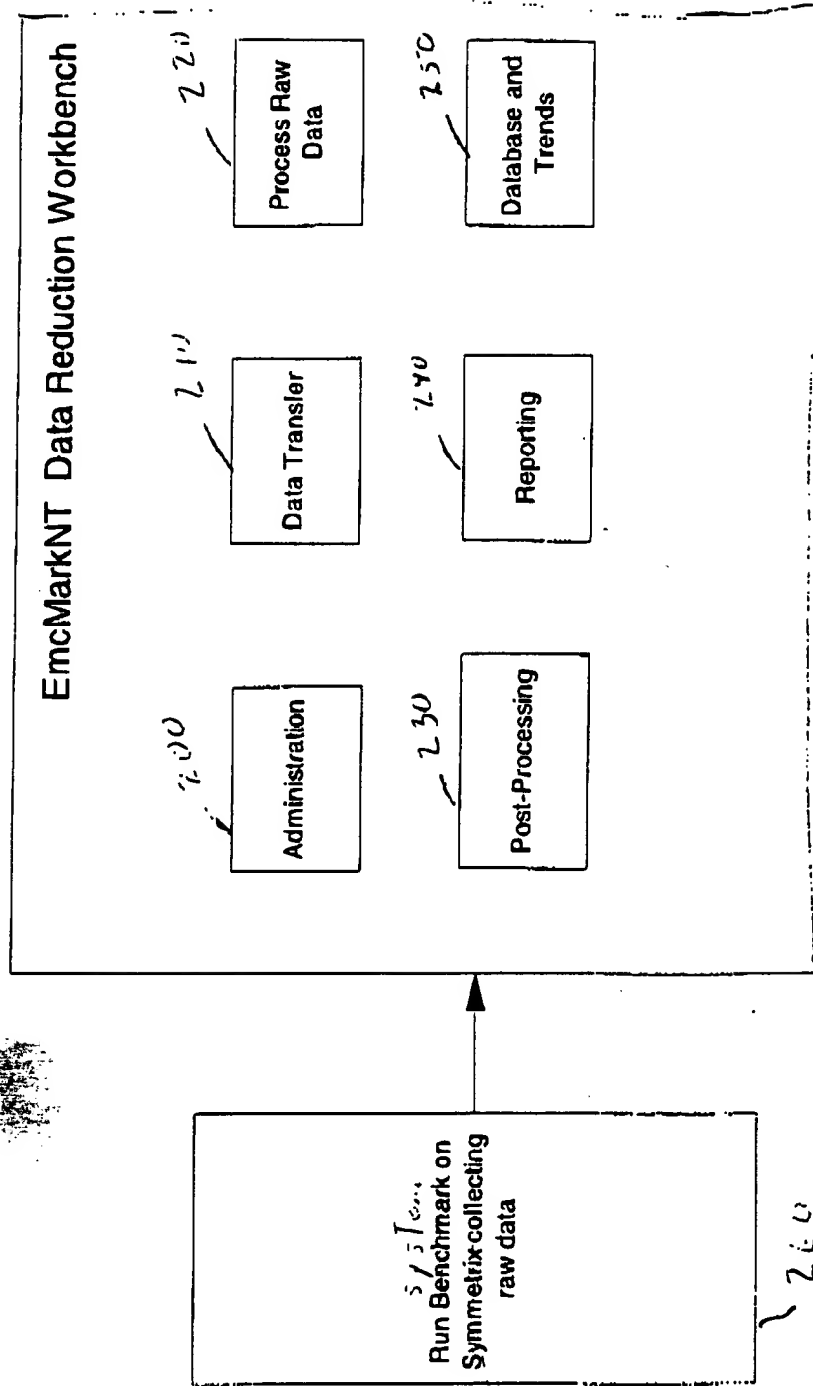
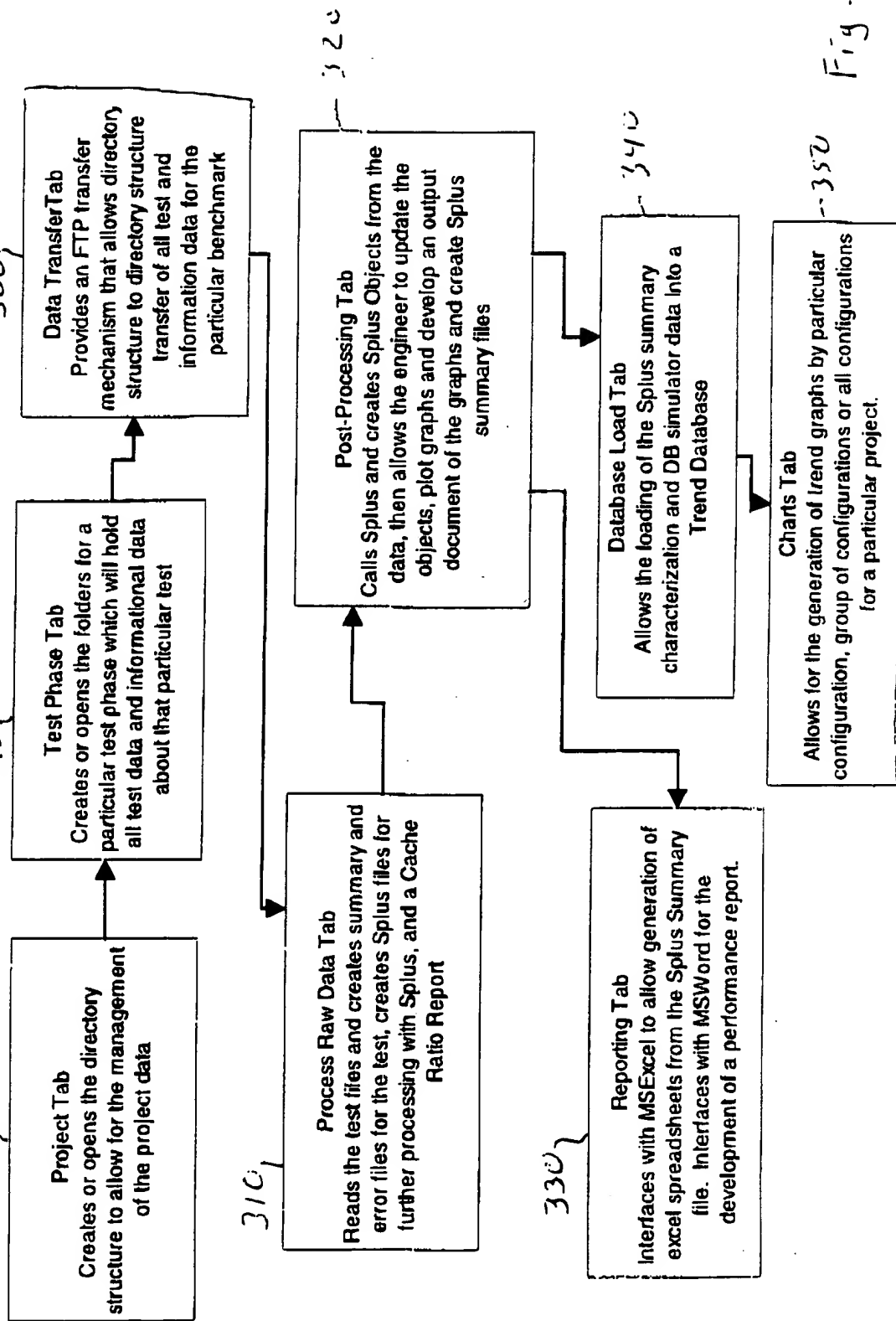
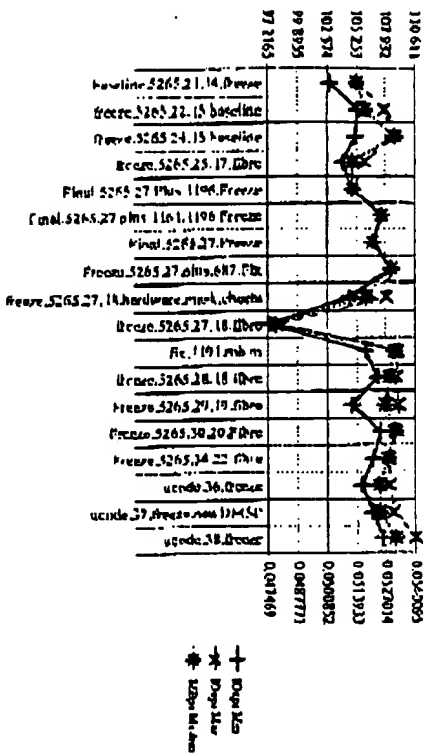


Fig. 6

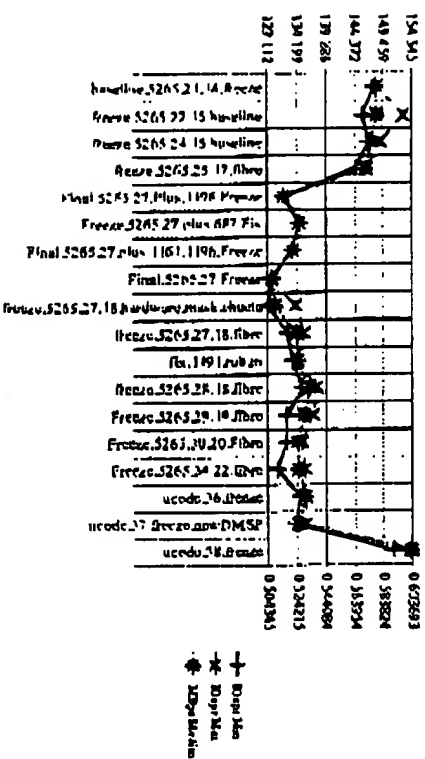
# EmcMarkNT Data Reduction Workbench Flow



### 10SDS and NDBs for Random Delayed Fast Write - Req Size 512

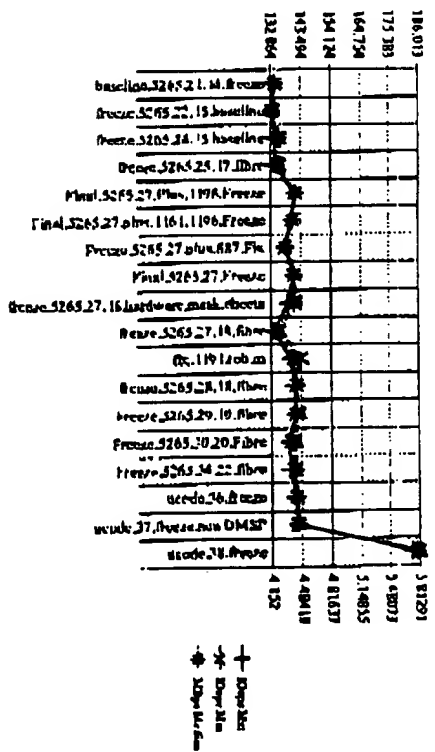


BA - 1 Battery - 1 EAPort - 1 DA - 1 DAPort - 1 Drive - 2 Lcm - 1 Hyper - 1

**Corps and Maps for Random Dehydrated Food Write - Reg Size 4096**

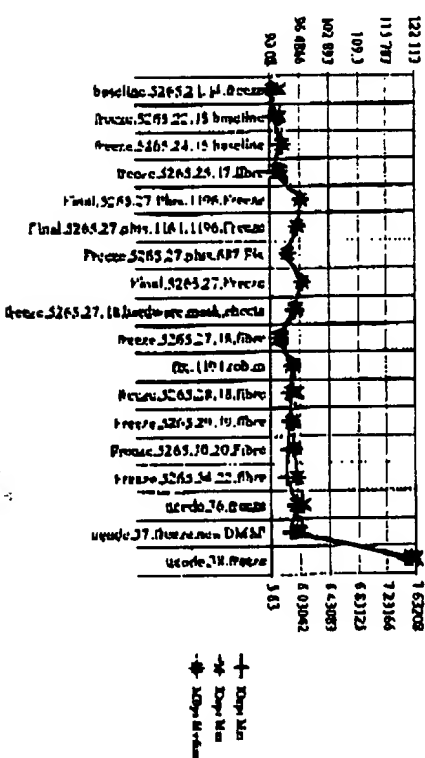
**BA-1** БАПтер-1 БАРен-1 DA-1 ДАПрор-1 ДАФер-1 Енто-1 Лм-1 Нгср-1

10ops and 1.1Bps for Random Delayed F est Write - Req Size 32768



BA-1 BAFer-1 BAFon-1 DA-2 DALter-1 DAFen-1 Dirm-1 Lm-1 Myr-1

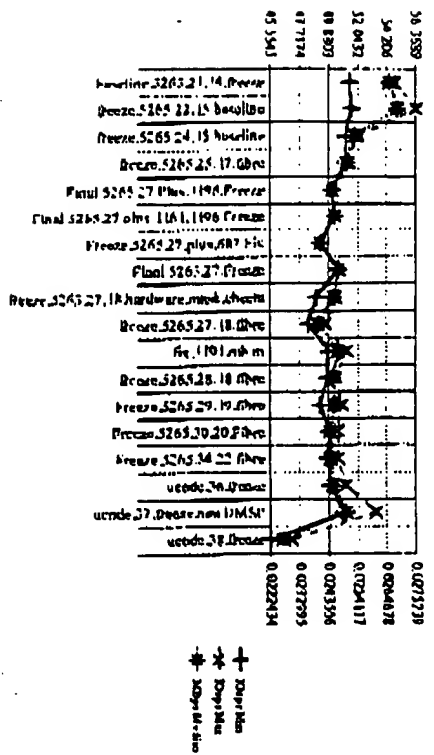
**10mps and 4MBps for Random Delayed Full Write - Req Size 64336**



BA-1 BAFm-1 BAFr-1 DA-1 DAFm-1 DAFr-1 DMm-1 DMr-1 Hym-1

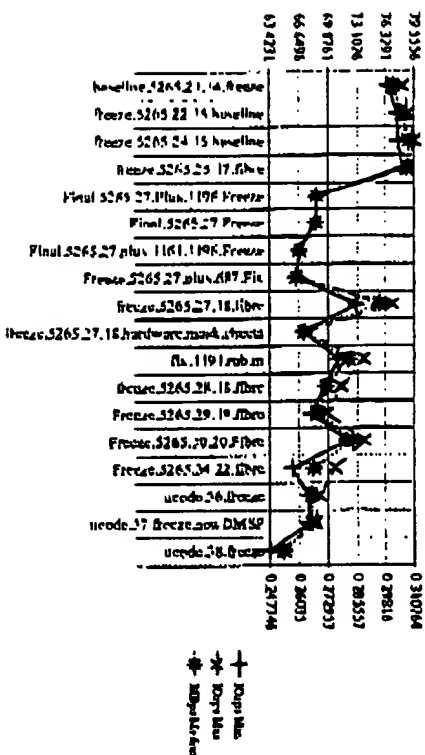
Fig 8A

**10RDS and M8BDS for Pardon Delayed Fast Write - Req Size 312**



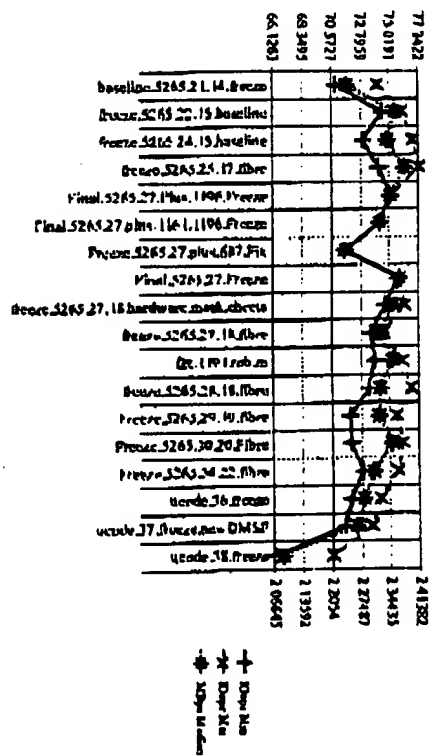
BA - 6 BAFto: - 4 BAFen - 4 DA - 1 DAFto: - 1 DAFen - 1 Drive - 1 Loo - 4 Hyper - 4

OSDs and MEPS for Random Delayed Fast Write - Req Size 4096



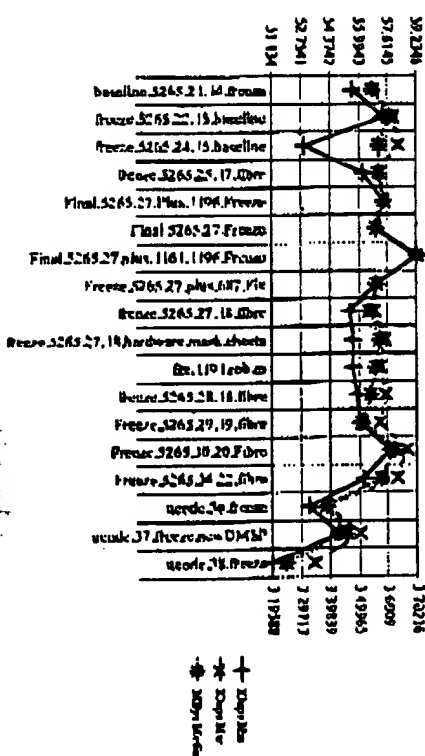
DA-4 RABot-4 BAWot-4 DA-1 DABot-1 DAFot-1 Dint-1 Lca-4 Hyter-4

10000 and 100000 for Random Delayed Feed White - Reg Size 32768



BA. 1 BAPM. 4 BAPM. 4 DA. 1 DAPM. 7 DAPM. 7 Dm. 3 Lm. 4 MPE. 4

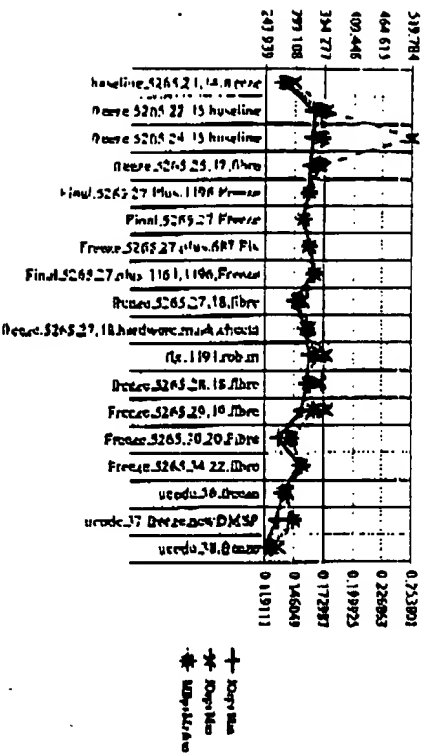
IOeps and MBps for Random Delayed Full Write - Req Size 4096



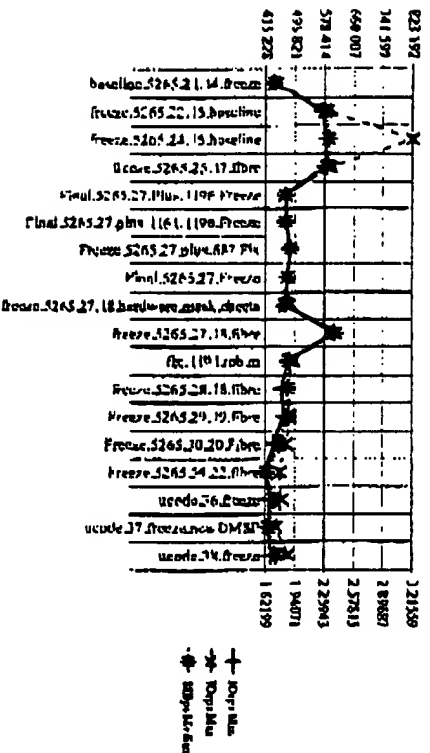
BA-4 BA7cc-4 BA7cd-4 DA-7 DA7cc-2 DA7cd-2 Ddr-1 Lnc-4 10ppm...

Fig 8B

### 1 star and above for Random Ordered Fast White - Red Stone (17



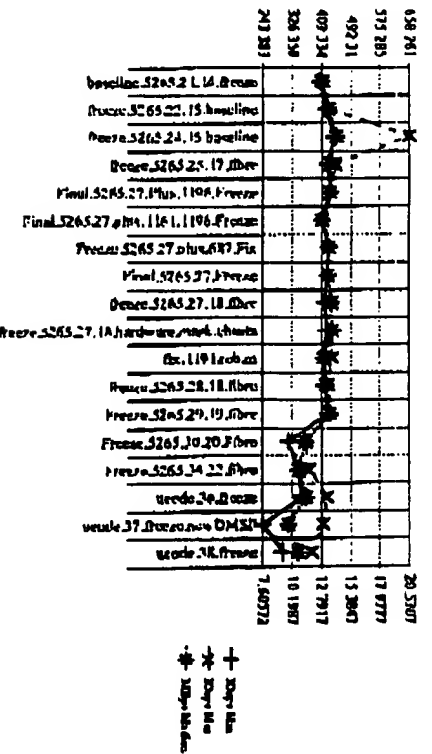
EN - 6 BATHO - 8 MASTB - 8 PA - 1 DASTOR - 7 EASTM - 7 DETW - 12 LON - 34 HUPR - 4

**IOps and MBps for Random Delayed First Write - Req Size 4096**

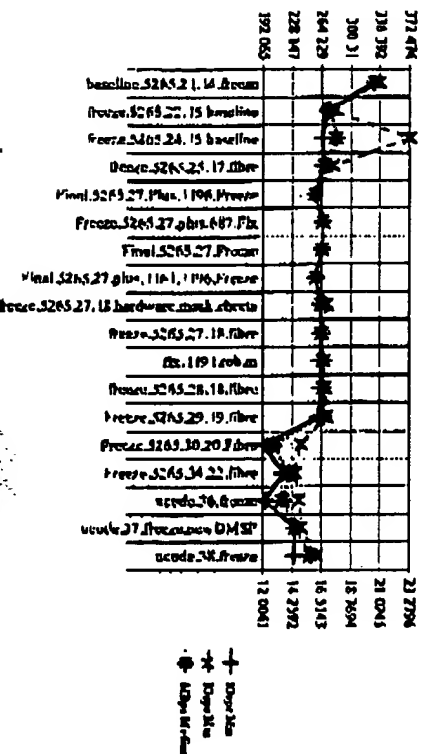
2A - 1 Raster - 1 BAPert - 4 DA - 2 DAPto1 - 1 DAPert - 1 Dctm - 12 Log - 24 HPT - 4

HA-1 BABY-1 BAPT-ADT-1 DAB-1 DAB-1 DAB-1 DAB-1

Xosha and MBoI for Random Delayed Find While - Red Size 66134



BA-4 BABY-0 BATH-0 DA-1 DATH-1 DATH-1 DTH-111-1111-0



HA-1 BABY-1 BAPT-ADT-1 DAB-1 DAB-1 DAB-1 DAB-1



## Post Processing Tab

The Post Processing Tab creates objects, plot graphs and generates summary files using the Splus Data Analysis Software.

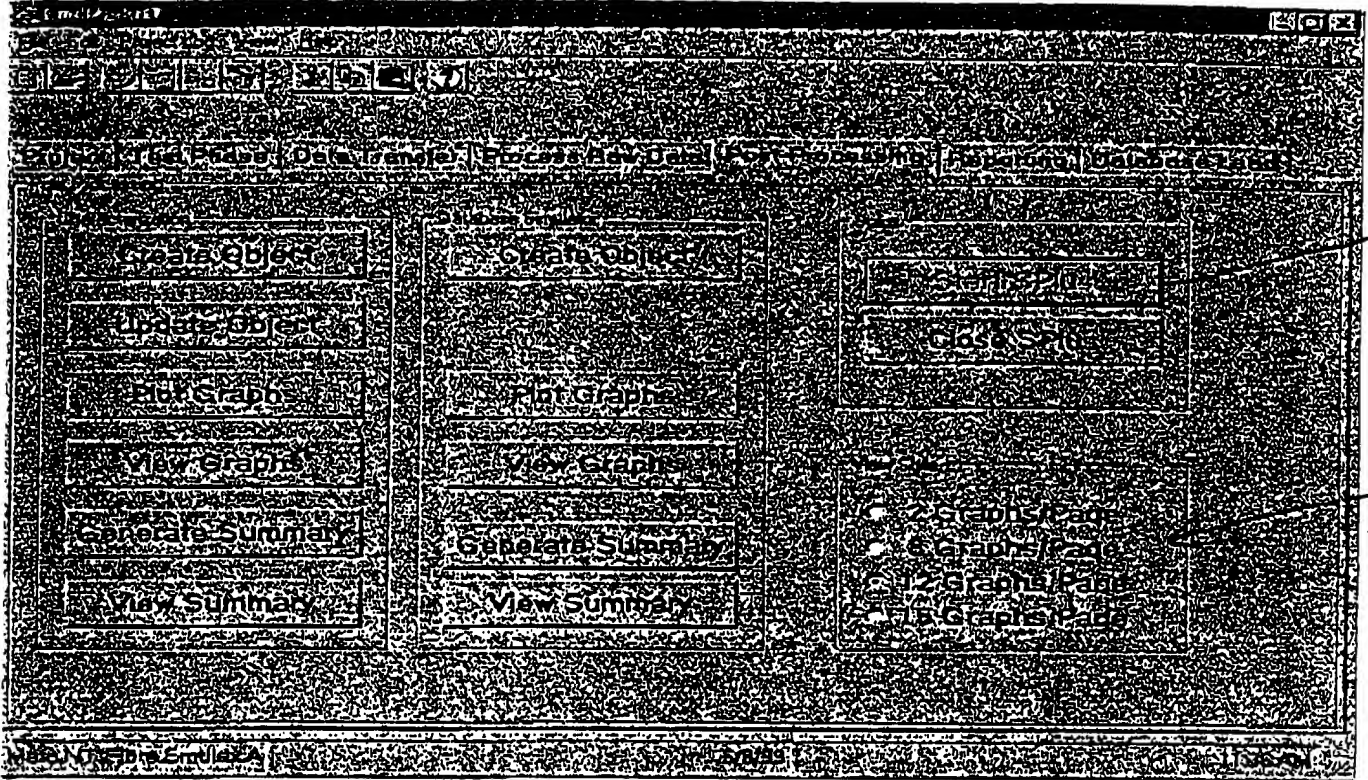
**Starting Splus**

Fig. 4

1. Click on the Start Splus Button  
(Object buttons will be grayed out until Splus is running. If graphs or summary files have already been created those buttons will be visible)
2. Bring up the Splus window to watch for errors and to use during the Update Objects routine
3. Select 2 graphs/page 8 graphs/page, 12 graphs/page or 15 graphs/page option for viewing the graphs once generated
4. Process Characterization or Database Simulator objects follow instructions on the next page.
5. Select the Close Splus button when you are leaving this tab  
(If there is a problem closing Splus, bring up the window and close manually. Select NO twice to its Save Reports and Objects questions)

(If you forget to close Splus before you exit the EMCMarkNT Data Reduction Tool you will need to quit out of Splus from the command line by typing `q()` or by file `-> exit`)

6. Go to the Reporting Tab

October 13, 1999

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## Symmetrix Configuration View

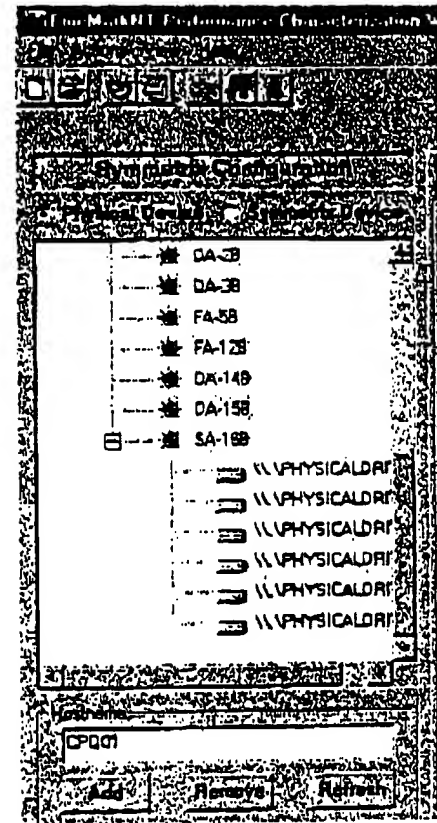
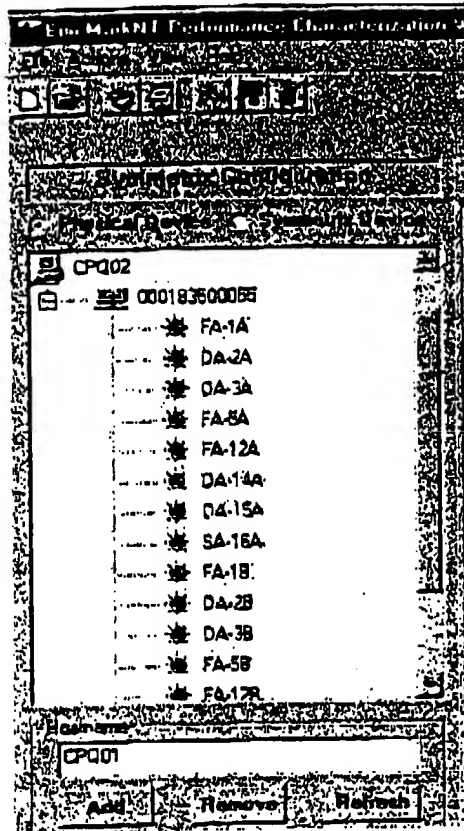
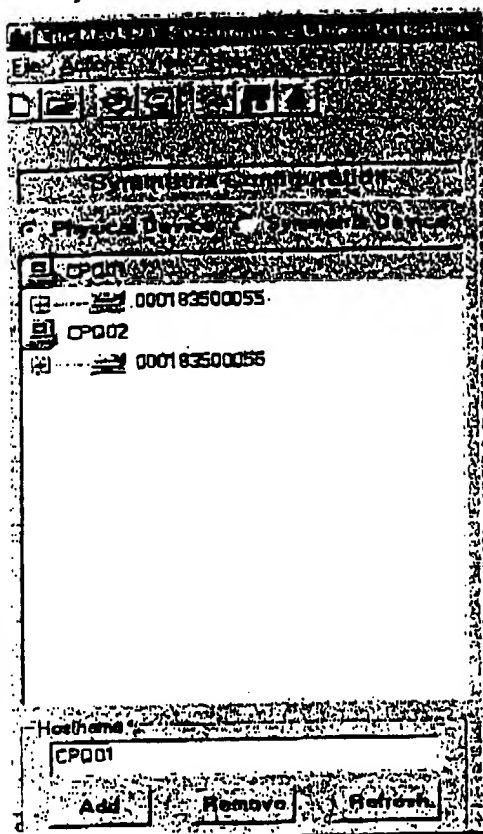


Fig. 9A

Lists the hosts and Symmetrix system

When the Symmetrix is expanded, BAs and DAs will be displayed. Red indicates inactive and green indicates active

Physical Devices – will list the physical device names connected to the Symmetrix

Symmetrix Devices - will list the Symmetrix device names connected to the Symmetrix

Hostname – is the host highlighted on the list

The first host in the list is considered the Master Host

If no host is listed then the host you are on is considered the Master Host

Local, Remote, Gateway

If the Master Host is the host you are on then the job will run locally

If the Master Host is not the host you are then the job will run remotely, except

If there is a gateway setup in the Environment Tab, then the job will run through the gateway

Add – will add the host name typed in the Hostname box

Remove – will remove the host name typed in the Hostname box

Refresh – will refresh the host/Symmetrix information

Device Details

Vendor:	EMC	Port:	0
Model:	SYMMETRIX	Port 1:	0
Symmetrix ID:	000183500055	Port 2:	2
Device:	SA-168		
Port Number:	1		

Symmetrix Device:	000	Block Size:	512
Physical Device:	\\PHYSICALDRVE0	Capacity:	7741440
Logical Device:		Cylinders:	8064
Serial Number:	55000321	Emulation:	FBA
Device Status:	Ready	Mirror Policy:	two-way mirror

<input type="checkbox"/> CDD	<input type="checkbox"/> META Head	<input type="checkbox"/> Power Path Parent	<input type="checkbox"/> RUF
<input type="checkbox"/> ASSOC	<input type="checkbox"/> META Member	<input type="checkbox"/> Power Path Child	<input type="checkbox"/> BGS
<input type="checkbox"/> VCM	<input type="checkbox"/> Gatekeeper	<input type="checkbox"/> Power Path Sibling	<input type="checkbox"/> BCP
<input type="checkbox"/> Head	<input type="checkbox"/> Multichannel	<input type="checkbox"/> No Channel	<input type="checkbox"/> META

OK

FIG. 9B

Symmetrix Details

Director Details	
Director:	FA-1A
Director Type:	Fibre Adapter
Director Num:	1
Slot Num:	1
SCSI Width:	N/A
Num Ports:	1
Port 0 status:	On
Port 1 status:	N/A
Port 2 status:	N/A
Port 3 status:	N/A

OK

FIG. 9C

Emulex Performance Characterization Workbench

06/25/1999

Symmetrix Configuration | Definition | Environment | Workload | Configuration | Benchmark | Results | Query

Project Name: Bison.Roland

Test Phase: Full.Box.110199.Test

Test Description:

Storage Array: Symmetrix

Model: 3830

Serial: 000183500055

Code: 5265

Code Date: 06231999

Hosttype: Auto

Hyper Policy: Auto

Minor Policy: Auto

Cache Size: 8GB

Physical Disks: 96 96

Disk Type: Auto

Hostname: cpc01

Add Remove Refresh

FIG- 9D

Project name – The project set up for this test.

- Select the New Project button to setup a new project, or the Open Project button to open a different Project.

Test Phase – the Test Phase setup for this test

- Select the New Test Phase button to setup a new test phase, or the Open Test Phase button to open a different Test phase under this project.

Test Description – comes from the ini file located in the Test Phase/Scripts folder

Storage Array Frame and Details Frame information from the ini file located in the Test Phase/Scripts folder  
You can manually update the fields, or if you double click on the Symmetrix box the information gathered from the Symmetrix will be populated into those fields and upon exit will be written to the ini file

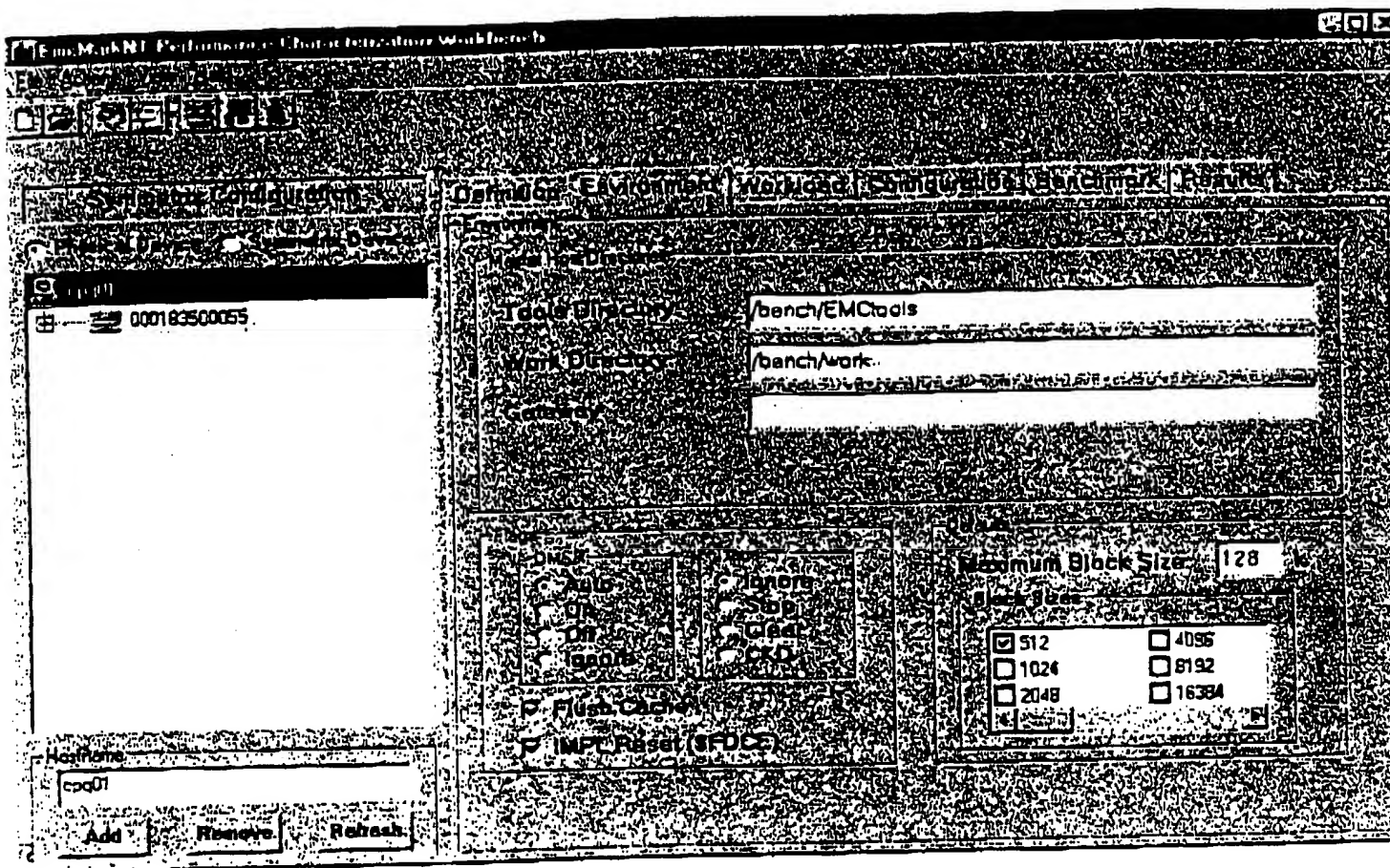


FIG 9E

Tools Directory - where the master scripts are located

Work Directory - your personal work folder

Flags -

DMSP

Trace

Flush Cache -

IMPL Reset (\$FDCE) -

Defaults - Maximum Block size set to 128k

- Default blocks sizes selected for Workload when run directly from the Workbench

- Not selected upon exit, must reset each time

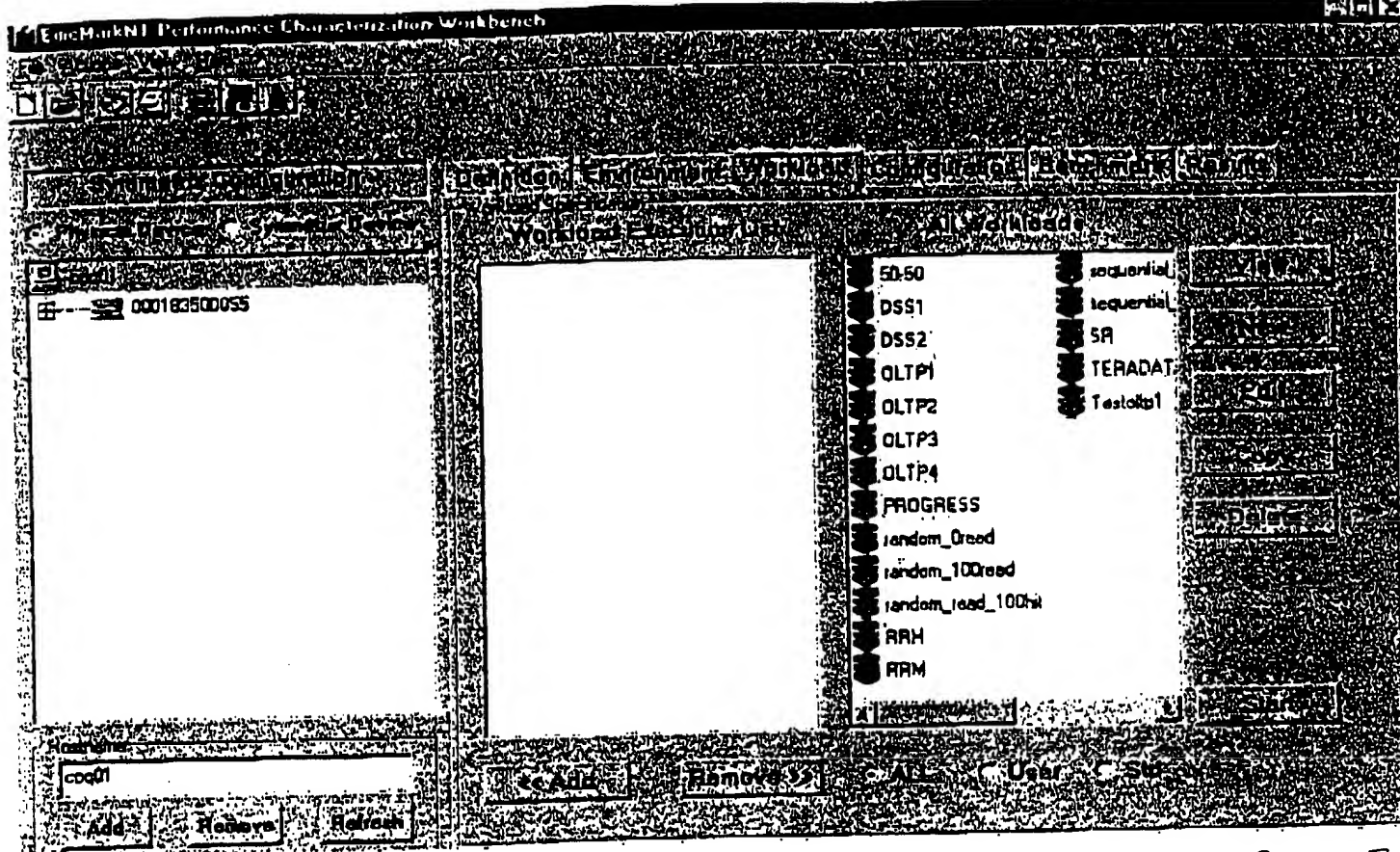


FIG 9F

**All** - All available Workloads **User** - User Defined Workloads **Std** - Standard Workloads

**View** - Allows viewing of the detailed definition of a Workloads

**New** - Brings up the Define Workloads form to define a new Workloads

**Edit** - Allows editing of User Defined Workloads

**Copy** - Copies the selected Workload into a new name, then brings up the Edit screen allowing edits to the new Workload.

**Delete** - Only for User Defined Workloads. Allows the deletion of a Workload.

**Add** - Moved the selected Workload over to the Workloads Execution List.

**Remove** - Removes item from the Workloads Execution List to the All Workloads List

**Start** - Brings up the Workloads Execution form to define and start the Workloads

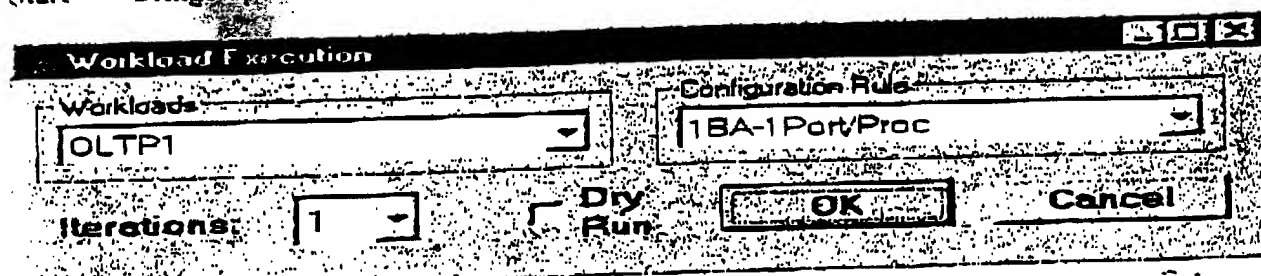


FIG 9G

**Iterations** - The number of iterations the Workload should run for

**Dry Run** - Dry run will run through the scripts but not execute the Workload

**OK** - Will execute the Workload, bringing up the EmcMark Workload monitor window

**Cancel** - Will cancel the Workload execution

## Response Time Workload

0942081900

- Max Seg cannot be  $\phi$
- Max Seg - max is Max Seg selection

7-12

## Throughput Workload

View Workload

random\_100read

1.0 0 20000

30 0 4 0

4 0 0 0

Workload Transaction Definition

Size	% of Workload	% Hit	% Random	% Read	% Write	% Seq	% Back
0 MB 0 KB 0 B	100	0	100	100	0 MB 0 KB 0 B	0 MB 0 KB 0 B	0 MB 0 KB 0 B

Request Size: MBytes KBytes Bytes

Alignment: MBytes KBytes Bytes

Back Alignment: MBytes KBytes Bytes

% of Workload: 100

% Cache Miss/Hit: 100

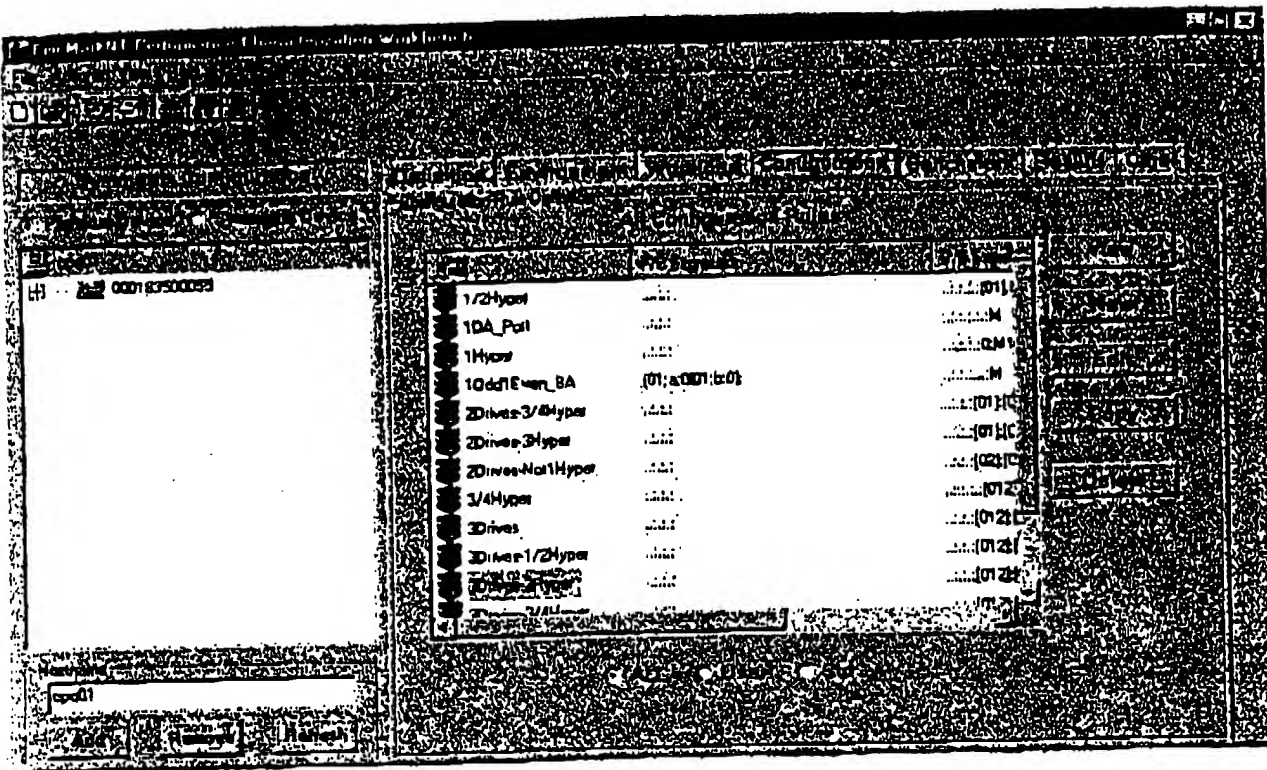
% Sequential/Random: 0 100

% Write/Read: 0 100

Insert Remove

FIG 9E

# Configuration Tab



All - All available Rules    User - User Defined Rules    Std - Standard Rules

(Fig. 9)

- View - Allows viewing of the detailed definition of Rule
- New - Brings up the Define Workloads form to define a new Rule
- Edit - Allows editing of User Defined Rules
- Copy - Copies the selected Rule into a new name, then brings up the Edit screen allowing edits to the new Rule.
- Delete - Only for User Defined Rules. Allows the deletion of a Rule.

0001:00500000

# Define Configuration

FIG 9K

Front End - BA/Processor/Port information pulled from SymAPI if Symmetrix connected  
 Back End - DA/Processor/Port information pulled from SymAPI if Symmetrix connected

Mirros, TIDs and Luns information pulled from SymAPI if Symmetrix connected

All/None buttons toggle checked boxes on or off.

Build Button - will built the expressions if the information has been downloaded from the Symmetrix. If no information is available then the expressions can be manually added to the F/E Expression and B/E Expression boxes.

Update Button - will update the F/E Expression and B/E Expression into the database.

OK will save the rule into the database  
 Cancel will terminate the definition

# Benchmark Tab

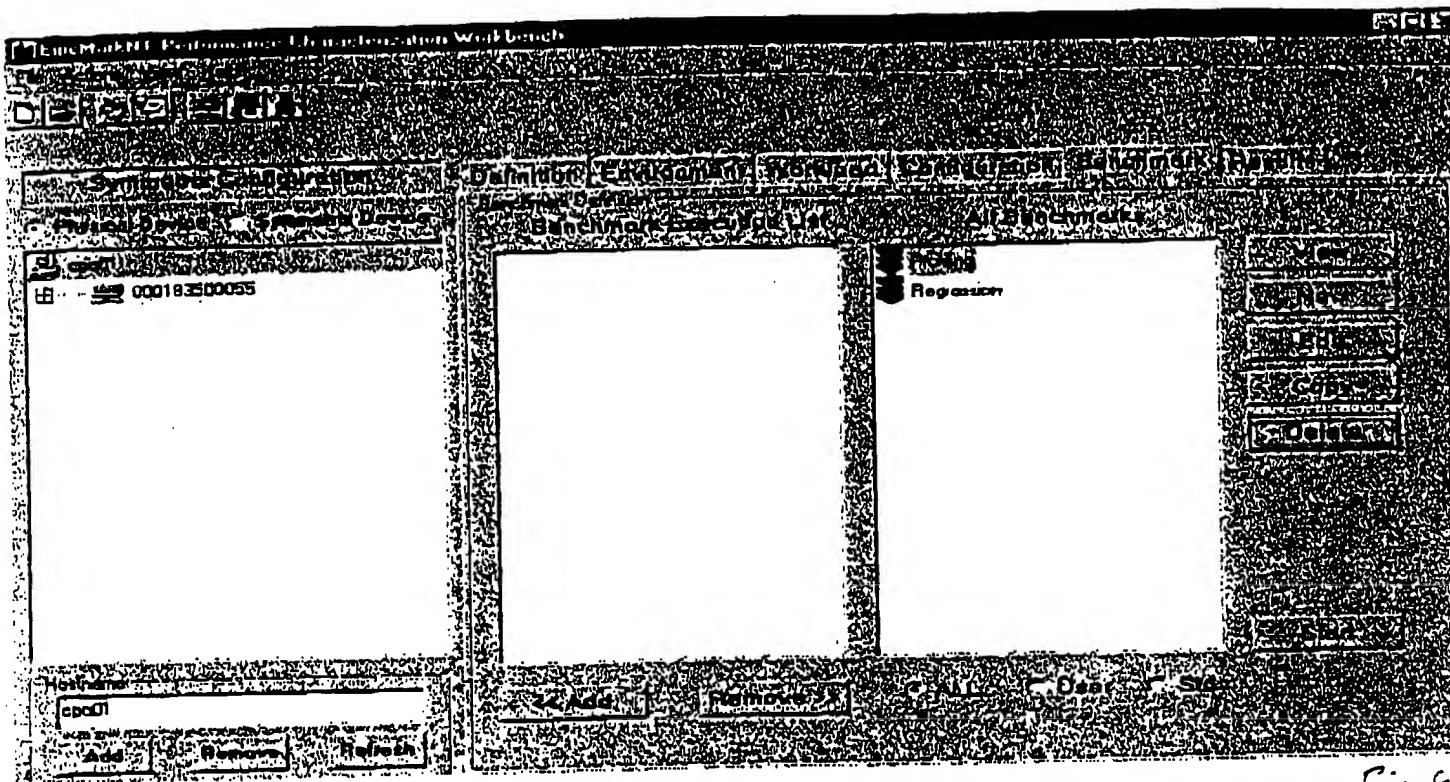


Fig 9

All - All available Benchmarks User - User Defined Benchmarks Std - Standard Benchmarks

View - Allows viewing of the detailed definition of a benchmark

New - Brings up the Define Benchmark form to define a new benchmark

Edit - Allows editing of User Defined Benchmarks

Copy - Copies the selected benchmark into a new name, then brings up the Edit screen allowing edits to the new benchmark.

Delete - Only for User Defined Benchmarks. Allows the deletion of a benchmark.

Add - Moved the selected benchmark over to the Benchmark Execution List. Only one Benchmark can be in the Execution list at a time

Remove - Removes item from the Benchmark Execution List to the All Benchmarks List

Start - Brings up the Benchmark Execution form to define and start the benchmark

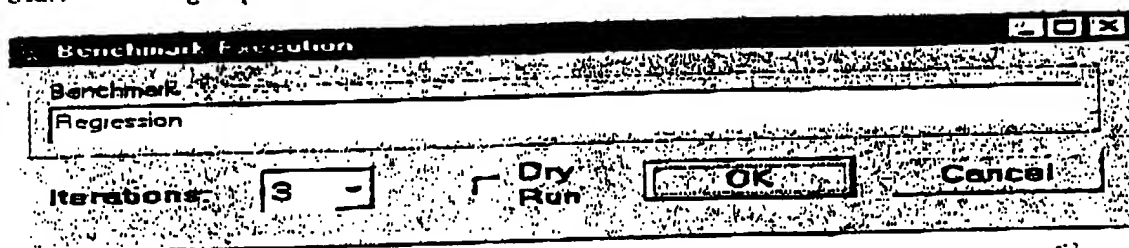


Fig 9.1

Iterations- The number of iterations the benchmark should run for

Dry Run - Dry run will run through the scripts but not execute the benchmark

OK - Will execute the benchmark, bringing up the EmcMark Benchmark monitor window

Cancel - Will cancel the benchmark execution

# Define Benchmark

00542268.001000

View Benchmark

Regression

OK Save

Benchmark Configuration

Workload	Configuration Rule	Queue Length	Cache Size	Max I/O	Min I/O
RAM	1Hyper	-1	-1		
RAM	Everything	-1	-1		
OLTP1	Everything	-1	-1		
OLTP2	3Hypers/4Drives	-1	-1		
OLTP3	1Hyper/2Drives	-1	-1		
DSS1	1Hyper	-1	-1		
DSS2	Everything	-1	-1		
TERADATA	2Drives/DA-3Hyper/4Drives	-1	-1		

Max Test Period:  Min Test Period:  Segment 1:  Segment 2:  Max Sequential IOPS:

Multiplex:  LSeeks:  Start I/O:  Disk Extent:

Workload:  Configuration Rule:  Insert Remove

RAM 1Hyper

File 90

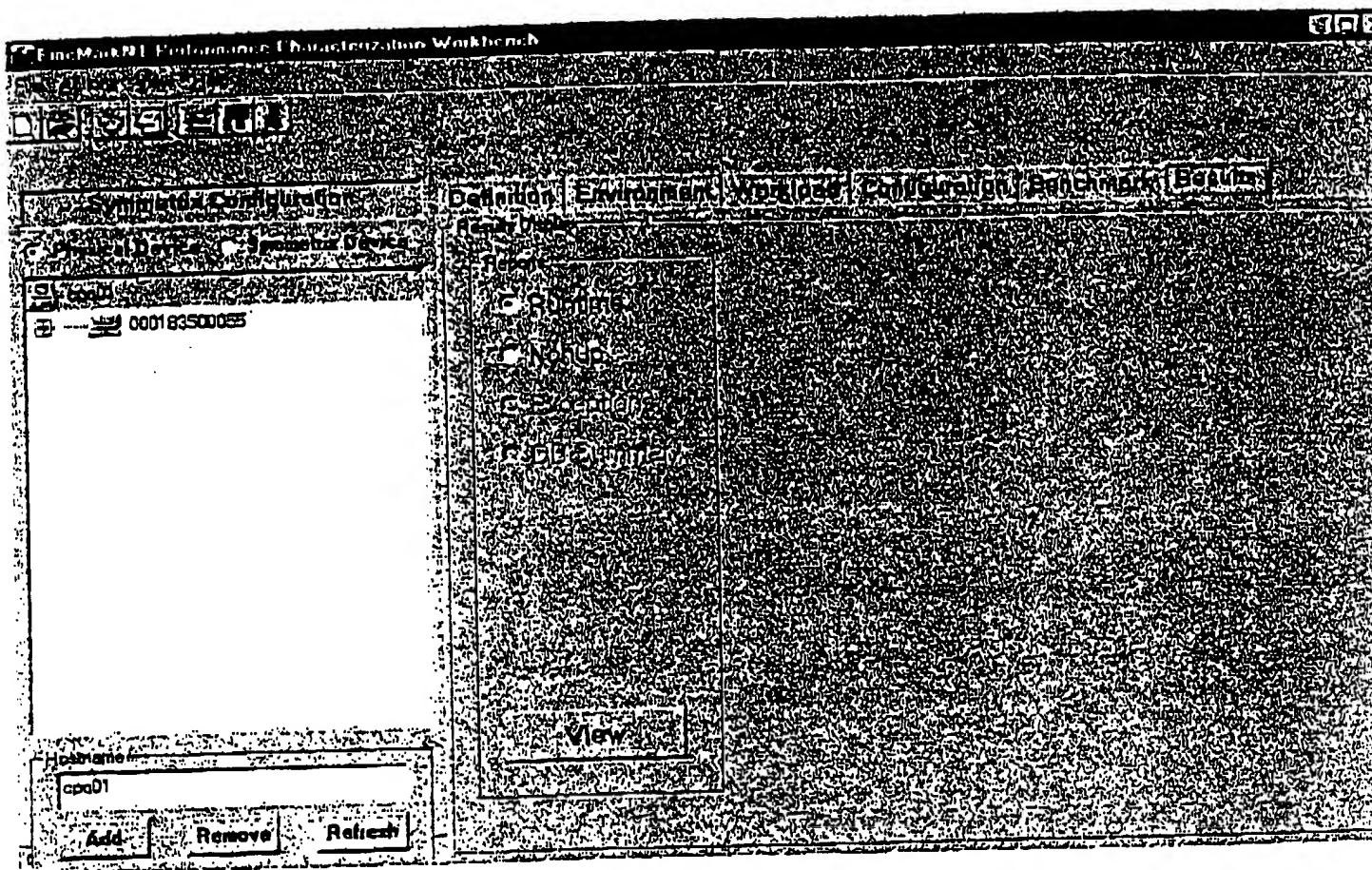


Fig 90

09642268-081800

008T80 08222960

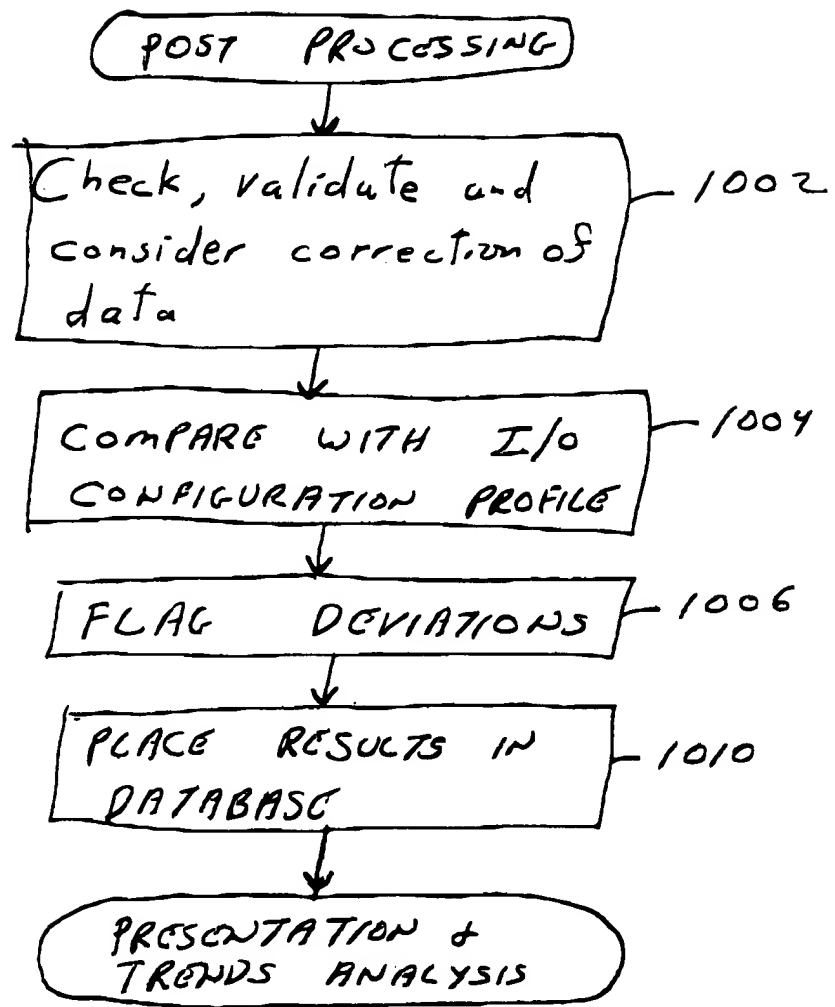


FIG. 10

This function is used when your data format is not standard and you need to sort your data in the correct format for Splus to read the file.

Fig. 10A

1. Select CTRL A
2. The Advanced Characterization Window will appear
3. Select the correct row/column/configuration/test description options for your data
4. Select the summary functions for your data
5. Select OK
6. A Characterization file will be generated in the Post Processing Folder with the extension \_adv.txt

Advanced Database Simulator Summary	
<b>Table Variables</b>	<b>Summary Functions</b>
Row	IO Function
Configuration	MB Function
Column	

1. Select CTRL B
2. The Advanced DB Simulator Window will appear
3. Select the correct row/column/configuration/test description options for your data
4. Select the summary functions for your data
5. Select OK
6. A DB Simulator file will be generated in the Post Processing Folder with the extension \_adv.txt

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File Descriptions

File Name	Description	HighLights
Char.Summary	Summary file of each Characterization test broken down by iteration, test type, and configuration	
Char.Splus	Data file feed to Splus to create Characterization Objects	
Char.Errors	Characterization errors produced from processing the raw data files.	Message appears if error file exists.
SX.Summary	SX summary data broken down by iteration, test type and configuration.	
SX.Splus	Data file feed to Splus. Used with Char.Summary file to create Characterization Objects	
SX.Errors	SX errors from processing the raw data files	Message appears if error file exists.
DB.Table	Summary file of each DB Simulator test broken down by iteration, test type and configuration	
DB.Splus	Data file feed to Splus to create DBSimulator Objects	
DB.Errors	DB Simulator errors produced from processing the raw data files	Message appears if error file exists.
SX_DB.Summary	SX DB summary data broken down by iteration, test type and configuration.	
SX_DB.Splus	Data file feed to Splus. Used with DB.Splus file to create DBSimulator Objects	
SX_DB.Errors	SX_DB errors produced from processing the raw data files	Message appears if error file exists.
Cache Ratio Report	Report tracking the Cache ratio from the Sym and the processed data	Rep rt name: "CacheRatioReport.txt" Located in the Raw Data folder Message appears if a report

Fig. 11

